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ABSTRACT

Two studies were conducted to determine the degree to which various types of power were employed in the classroom and the effects of each type on both cognitive and affective learning. The primary focus of the first study was to determine the degree to which teachers and students shared perceptions of the use of power in the classroom. Power was measured as relative or perceived. A total of 156 teachers and 2,698 of their students provided data. The results indicated that even though statistically significant associations between teacher and student were found, teacher and student perceptions of the use of power were not isomorphic. The results also indicated that both teachers and students viewed the overwhelming proportion of power use to stem from reward, reference, and expert bases. The second study focused on the degree to which use of power in the classroom was associated with cognitive and affective learning. The results, based on data from 151 teachers and 2,603 of their students, indicated that perceived use of power could account for approximately 30% of the variance in cognitive learning and up to 69% of the variance in affective learning. Coercive and, to a lesser extent, legitimate power were found to be negatively associated with learning while referent and, to a lesser extent, expert power were found to be positively associated with learning. Reward power was found to have no meaningful association with learning.
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POWER IN THE CLASSROOM: TWO STUDIES

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Abstract

The primary focus of Study I was to determine the degree to which teachers and students have shared perceptions of the use of power in the classroom. A total of 156 teachers and 2698 of their students provided data. The results indicated that even though statistically significant associations between teacher and student were found, teacher and student perceptions of the use of power are not isomorphic. The results also indicated that both teachers and students view the overwhelming proportion of power use to stem from reward, referent, and expert bases.

The primary focus of Study II was to determine the degree to which use of power in the classroom is associated with cognitive and affective learning. The results, based on data from 151 teachers and 2603 of their students, indicated that perceived use of power can account for approximately 30 percent of the variance in cognitive learning and up to 69 percent of the variance in affective learning. Coercive, and to a lesser extent legitimate, power were found to be negatively associated with learning while referent, and to a lesser extent expert, power were found to be positively associated with learning. Reward power was found to have no meaningful association with learning. Recommendations for teachers, based on these results, are discussed.

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POWER IN THE CLASSROOM: TWO STUDIES

The use of power by a teacher is an inherent characteristic of classroom instruction. The purpose of this series of research studies was to determine the degree to which various types of power are employed in the classroom and the effects of each type on both cognitive and affective learning.

Power in the Classroom: Study I

Education has been undergoing rapid change in the last several years. New modes of learning have been espoused and new techniques/strategies are being encouraged as alternative methods to the traditional classroom model. However, "the traditional view of education, a view that still prevails, holds that learners must submit themselves to teachers" (Menges, 1977, p. 5). As Menges further suggests, this view means that the teachers' authority is not to be questioned. The underlying assumption is that without the use of power by the teacher over the student, the student cannot learn.

Hurt, Scott, and McCroskey (1978) suggest that in a classroom setting "a certain degree of teacher power is always present" (p. 125). They continue by suggesting that the more power is employed by the teacher as a means of control, the more likely it will be required as a means of control. In other words "the more it is used, the more it will need to be used" (p. 125).

The primary focus of this study is to determine the degree to which teachers and students have shared perceptions of the use of power in the classroom. If there is a high degree of shared perceptions, this might illustrate that both teacher and student are aware of power and its outcome. If there is a low degree of shared perceptions, this might suggest that the communication between the teacher and student is ineffective. For example, if the student doesn't like the type of power employed by the teacher but can recognize it when it is used he/she will be able to respond appropriately. However, if the student cannot recognize the type of power communicated by the teacher, he/she might respond inappropriately. The key is to determine if students and teachers have shared perceptions about the kinds of power employed in a classroom. If this is determined, then both teachers and students can be taught what types of power produce certain outcomes (i.e., learning).

The Nature of Power

"Power" is a term commonly employed in a wide variety of academic disciplines. Not surprisingly, the constituent definitions of the term are far from consistent from one discipline to another, or even within a given discipline. This review will not attempt to discuss all of the ways the term "power" is used in the varied literatures. Rather, we will examine only a few that are particularly pertinent to the present investigation.

One of the more narrow views of power in the classroom is provided by Hurt, et. al. (1978, p. 124): "Power refers to a teacher's ability to affect in some way the student's well-being beyond the student's own control." This view suggests an absence of intellectual assent to influence on the part of the student. While this may be the case in many instances, in many others students willingly accept the power of the teacher to influence their behavior. While we find this definition flawed, we hasten to add that our experiences with hundreds of in-service teachers in workshops and seminars indicates that the "lay definition" of most of these individuals is highly consistent with the Hurt, et. al., definition.

Considerably broader views of power are expressed by a number of other writers (eg. Cartwright & Zander, 1968; Goldner, 1970; McClelland, 1975; Zaleznik & Kets de Vries, 1975). Power is typically defined by these writers as an individual's

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potential to have an effect on another person's or group of person's behavior. More specifically, this broader view sees power as the capacity to influence another person to do something he/she would not have done had he/she not been influenced. In short, an individual exhibits some type of change in her/his behavior, attitudes, beliefs, etc. as a result of influence from someone else. However, French and Raven (1968) qualify this type of definition by noting that such change must be a direct result of the influence exerted by another rather than the result of a combination of forces which may have exerted additional influence. From this view of the nature of power, French and Raven (1968) identified five potential bases of power: coercive, reward, legitimate, referent, and expert.

The Bases of Power

French and Raven's (1968) bases of power are all founded on the perceptions of individuals over whom the power might be exerted. Although French and Raven (1968) were not writing with the classroom as their intended focus, we will examine these power bases in this context below.

Coercive Power. A teacher's coercive power is based on a student's expectations that he/she will be punished by the teacher if he/she does not conform to the teacher's influence attempt. The strength of the teacher's coercive power is contingent upon the student's perceptions of how probable it is that the teacher will exact punishment for non-conformance and the degree of negative consequences such punishment would entail, minus the probability of punishment from other sources (eg. from peers, the behavior itself, etc.) if the student does comply with the teacher's influence attempt. It is important to note here that in environments where very strong peer-group pressure against the teacher exists, the teacher may have no coercive power at all, even though the teacher may be in a position to exert a high degree of punishment.

Reward Power. A teacher's reward power is based on a student's perception of the degree to which the teacher is in a position to provide rewards to her/him for complying with the teacher's influence attempt. Such rewards may involve providing something positive (positive reinforcement) or removing something negative (negative reinforcement). As was the case with coercive power, the strength of a teacher's reward power is mediated by the possibility of receiving other rewards from other sources as a function of non-compliance.

Although it is often not recognized, coercive and reward power essentially are the flip side of the same coin. Coercive power involves introducing something unpleasant or removing something pleasant if the student fails to comply. Reward power involves introducing something pleasant or removing something unpleasant if the student does comply.

Legitimate Power. Legitimate power often is referred to as "assigned" power. It stems from the assigned role of the teacher in the classroom. Legitimate power is based on the student's perception that the teacher has the right to make certain demands and requests as a function of her/his position as "teacher". This type of power generally is most related to mundane matters, such as controlling classroom time, determining what unit should be studied, regulating interaction, and the like. It generally does not extend beyond the school environment into the private lives of students. In some cases, however, this type of power is much broader. A prime example is the coach who sets up training rules. Usually the athlete will comply with these rules because they are seen as "legitimate" demands from this person because of her/his role as coach. Similar demands from the art teacher likely would be ignored.

Referent Power. The foundation of referent power is the student's identification with the teacher. This type of power is based on the relationship between two people. Specifically, it is based on the desire of the less powerful person (the student) to identify with and please the more powerful person (the teacher). The stronger the student's attraction to and identification with the teacher, the stronger the teacher's referent power.

Expert Power. Expert power stems from the student perceiving the teacher to be competent and knowledgeable in specific areas. Most information taught in a classroom is presented from a base of expert power. The ideas are not "proven" in an objective sense. They are presented with the expectation they will be accepted by the student. To the extent the student sees the teacher as competent and knowledgeable, this expectation will be correct. French and Raven (1968) stress that the main impact of expert power is change in an individual's cognitions. Any change in behavior is a secondary result of that influence.

The Communication of Power

The use of power requires communication. Often, power is used to influence without explicit verbal communication. When a teacher tells a student to do her/his homework, it usually is not necessary to say "or I will punish you by lowering your grade" or "because I am the teacher and I have the right to demand you do this" or "because you like me and want to please me". Such appeals to power are implied and generally recognized by the student without being directly stated.

In other instances, direct power appeals are stated. Coercive power, for example, may be invoked when a teacher says "If you don't turn your work in on time, I will give you an 'F' for the assignment". Similarly, reward power may be invoked when a teacher says "If you do this extra problem, I will give you five bonus points". An appeal to referent power may take the form of the teacher saying "Will someone help me set up this film projector?"

Whether power appeals are directly stated or implied, for teacher power to influence behavior the student must associate the requested behavior with the power of the teacher. All teacher power is based on student perceptions. If the student does not perceive the teacher to have a certain type of power, a teacher's appeal to that power, whether direct or implied, is not likely to result in influence. Similarly, even if the student perceives the teacher to have the power, if the influence attempt is not associated with the power, the attempt is likely to be unsuccessful.

Purpose of Study

The present paper reports the first of a series of studies investigating the role of teacher power in student learning. The ultimate purpose of this research program is to determine how teacher power impacts student learning and how teachers may modify their behavior and use of power to enhance learning in the classroom. The implicit assumption in this research is that a teacher cannot avoid using power in the classroom, that use of power is an inherent part of the teaching process. However, it is also assumed that use of some bases of power will result in more positive learning than use of other bases. A primary goal of this series of studies is to test and refine this latter assumption.

The first study was designed to accomplish two objectives: 1) to determine an acceptable method of measuring use of power in the classroom, and 2) to determine the degree to which teachers and students have shared perceptions of the use of power in the classroom.

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Method

Measurement of Power

As noted previously, the constituent definitions of power in the literature are highly diverse. Similar diversity is characteristic of operational definitions. Consequently, the selection of measuring instruments was crucial to the furtherance of this research.

Since we chose the conceptualization of power advanced by French and Raven (1968) as the foundation for our work in this area, it was considered vital that a measure isomorphic with this conceptualization be selected. The original authors provide no suggestions for measurement of power based on their conceptualization. However, Student (1968) introduced an appropriate approach. In his work based on the French and Raven (1968) conceptualization, Student (1968) provided subjects with a description of each type of power and asked them to estimate (on a five-point, Likert-type scale) the extent to which they complied with their supervisor's wishes because of that type of power. The validity of this approach was suggested by the strong results he obtained relating to both employee satisfaction and productivity.

More recently a modification of the Student (1968) approach was introduced by Richmond, McCroskey, Davis, and Koontz (1980). Their research was focused on organizational communication and employed a variety of employee samples, one of which was public school teachers. Because of the difficulty in estimating the reliability of the single-item type measure used by Student (1968), Richmond, et. al. (1980) employed five seven-point, bipolar scales for each type of power. They provided subjects with a description of each type of power and asked the subjects to respond to the following statement for each type of power on the five scales: "My supervisor employs _____ power." The appropriate name for each power base was inserted in the blank. The bipolar scales they employed were: agree-disagree, false-true, incorrect-correct, wrong-right, and yes-no. The substantial associations they found between the bases of power and employee satisfaction and management communication style (MCS) are suggestive of validity for this measure.

For the present research the Richmond, et. al. (1980) instrument was employed as our primary measure of power in the classroom. We shall refer to this measure as the perceived power measure (PPM). We made only minor modifications. When our subjects were teachers, we modified the response statement to read: "I use _____ power." When our subjects were students, the statement read: "My teacher uses _____ power." As we will report later, the reliabilities we obtained were very high and comparable to those reported by Richmond, et. al. (1980).

While this instrument is highly reliable and has, in slightly different forms, a fairly good case for validity, it measures use of power in an absolute rather than a relative form. It is possible for a power source to be rated extremely highly (or any other level) on all of the power bases simultaneously. Since we believed that the relative use of the five power bases in comparison to each other may be as important as the degree of each's use, we employed a second measure of power to supplement the information provided by the first.

We shall refer to the second measure as the relative power measure (RPM). This measure also explains the five power bases. It then requests the subjects to estimate the percentage of total power usage that stems from each base, with the requirement that the total equals 100 percent. To illustrate, the instrument for teachers takes the following form:

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Presuming that 100 percent represents all of the power that you use with your students, please estimate the percentage which you use in each of the five categories below. For example, if you use a lot of coercive power but little else, you might respond as follows: 80 coercive, 5 reward, 5 legitimate, 5 referent, 5 expert. Be sure the total percentage for the five categories adds up to 100.

_____ coercive
_____ reward
_____ legitimate
_____ referent
_____ expert
_____ Total

These two measures, then, were our operational definitions of power in the classroom. The PPM measures power use in a more absolute form, while the RPM was designed to measure power use in a relative form.

Samples

Data for this study were drawn from paired samples of teachers and classes of students. A total of 156 teachers and 2698 of their students provided usable data. An additional 4 teachers and 163 students provided incomplete data and were excluded from the data analyses.

To insure as much generalizability as possible, teachers and students were selected from diverse educational levels and academic disciplines. All levels from seventh grade through college were included. Similarly, teachers and classes from sciences, humanities, social sciences, and arts were included. At the college level, both regular faculty and graduate assistants were included. The only restriction placed on selection of a class for inclusion was enrollment. No large classes (over 35) were chosen. Because the method of data collection provided strong guarantees of anonymity, we are unable to specify the exact number of respondents in each category. The original sample included 200 teachers selected in a systematic, non-random manner. Forty, or 20 percent, did not return the data collection instruments. However, on the basis of the legible postmarks and return addresses of the materials returned, no systematic bias was suspected.

Procedure

Because of the sensitive nature of the data being collected and the obvious potential for providing socially desirable responses, it was deemed that anonymity of responses must be absolutely assured. Consequently, no personal information was requested from either the teachers or the students. However, it was necessary to be able to pair student responses with those of their teacher. Thus, each teacher was asked to select a five-digit number at random and record it on their response form. They were asked to request that each of their students place the same number on their forms.

Teachers were selected and asked to participate. Those that agreed were sent the appropriate forms with instructions for their completion and return. No follow-up correspondence to increase return rate was employed because the anonymous responses did not permit knowledge of who had returned materials and who had not.

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Data Analyses

All data analyses were performed with the assistance of the SAS statistical package. Data for individual subjects were punched separately and teacher and student data paired by means of the MERGE procedure available in this statistical package.

The data analysis included several procedures. 1) Alpha reliability estimates were computed for the PPM responses for both teachers and students. 2) Means for PPM and RPM responses for both teachers and students were computed. 3) These means were tested (t-tests for related samples) to determine significance of differences between teacher and student samples. 4) Canonical correlational analyses were separately computed for the PPM and RPM data as tests of overall association between teacher and student responses. 5) Simple correlational analyses for each power base were performed on the PPM and RPM data as tests of specific association between teacher and student responses.

Results

The reliability estimates for the five dimensions of the PPM are reported in Table 1. As noted in that table, the reliabilities are very high. While such high reliability certainly is desirable, it also indicates the need for the expanded number of items is doubtful. Additional examination of the data indicated that the lowest correlation of any item with the total score for a given power base was .92. Thus, the use of a single item to measure perceived power for each base, as employed by Student (1968), would probably be sufficient.

The means and standard deviations for the scores on both the PPM and the RPM are reported in Table 2. The difference between teacher and student scores on each measure are also reported in that table as are the obtained t's for the tests for the significance of these differences.

Both the students and the teachers indicated on the PPM that coercive power is less likely to be used than power from other bases. The teachers and students did not differ in their perceptions of how likely either coercive or legitimate power are to be employed. Their perceptions did differ, however, on all three of the other power bases. Teachers saw themselves as likely to use more reward, referent, and expert power than did the students.

In relative terms, as indicated by the RPM scores, both teachers and students report greater use of expert, referent, and reward power than coercive power. However, students saw coercive power as accounting for a higher proportion of power use than did teachers, while teachers saw a significantly higher proportion for expert power than did students.

The canonical analysis of the PPM data indicated significant correlations for the first three variates extracted. The first variate (r_c=.53, $p<.001$) was primarily a function of student and teacher perceptions of the use of coercive and legitimate power. The second variate (r_c=.37, $p<.001$) was primarily a function of student and teacher perceptions of the use of expert power. The third variate (r_c=.33, $p<.01$) was most associated with student and teacher perceptions of reward and referent power. (See Table 3 for correlations of all power variables with the variates).

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The canonical analysis of the RPM data indicated significant correlations for only the first two variates extracted. The first variate (r_c=.50, $p<.001$) was primarily a function of student and teacher reports of the proportion of use of coercive and referent power. The second variate (r_c=.38, $p<.05$) was most associated with reports concerning reward and expert power. (See Table 3 for correlations of all power variables with the variates).

The simple correlations between teacher and student reports on all of the dimensions of both PPM and RPM are reported in Table 2. All of the correlations on the PPM are statistically significant, with the highest (r=.46) being the association for coercive power. On the RPM measure all of the correlations are also significant, with the exception for that relating to legitimate power. As was the case with the RPM scores, the highest association was for coercive power (r=.37).

Discussion

The results of this study suggest the measures employed are useful instruments for studying power in the classroom. The reliability of the PPM instrument is so high that even fewer items can probably be employed successfully. Although the reliability of the RPM measure could not be assessed because of its single-response type format, the results obtained on the PPM and the earlier results obtained by Student (1968) suggest perceptions of people relating to power are so strong they may be reliably measured with single-response scales. These results suggest, then, that our first goal--to develop instruments which can be used to measure power in the classroom--has been achieved satisfactorily.

The second goal of this study was to determine the degree to which teachers and students have shared perceptions of the use of power in the classroom. The results indicate that, although there is substantial and statistically significant association between these perceptions, they are far from isomorphic. In nine of ten cases, the observed correlations were statistically significant, but the highest association was only .46. Thus, even at best, the teachers and students share only a little over 20 percent of variance.

An examination of the mean differences on the measures gives us more insight into the differences in teacher and student perceptions. If we view coercive power negatively and reward, referent, and expert power positively (as is suggested in much of the education literature), it is clear that the teachers have a much more positive view of their behavior than do the students. Interestingly, however, both teachers (70.3%) and students (67.1%) see the overwhelming proportion of power use to stem from reward, referent, and expert bases. Thus, it would not be correct to conclude from this study that teachers see their behavior in a positive light while students see it in a negative light. They both have a generally positive view, but the teacher view is a bit more positive.

The aggregate data represented by mean scores and the correlational data from the measures suggest what may seem to be conflicting conclusions. The mean data suggest substantial similarity in teacher and student responses. Even where statistically significant differences exist, they generally are small. The largest on the PPM accounts for 24 percent of the total score range, while the largest on the RPM accounts for only about five percent. While students collectively have a somewhat more negative view of their teacher's power usage than the teacher does, the generally modest correlations between teacher and student perceptions indicate that many students have a more positive view of their teacher's use of power than does the teacher her/himself.

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Since teachers and students do not have the same perceptions of power use, and the differential perceptions cannot be simply explained by self-serving interests, the question that needs to be addressed is whose perceptions are right? Or, to put it another way, whose perceptions should be researched? While we do not wish to take an absolutist approach to right and wrong on this issue, we do believe that the perceptions of the students are the more critical perceptions, hence should be the main focus for future research. Students will respond in the classroom on the basis of how they perceive that classroom to be, not on the basis of how their teacher perceives it. Their perceptions of their teacher's behavior, while certainly affected by what the teacher thinks and does, are the direct precursors of their classroom behaviors. Thus, we believe, the impact of teachers' use of power in the classroom on student learning is mediated by the students' perceptions of that power use.

While future research should continue to examine the relationship between teachers' perceptions of their power usage and student learning, we believe the higher and more meaningful associations will be found between student perceptions of teacher power and their own learning. Study II in this program directly tests this belief.

Power in the Classroom: Study II

The second study investigated the role of teacher power in student learning. The ultimate purpose of this research program is to determine how teacher power impacts student learning and how teachers may modify their communication behavior and use of power to enhance learning in the classroom. The implicit assumption in this research is that a teacher cannot avoid using power in the classroom that use of power is an inherent part of the teaching process. However, it is also assumed that use of some bases of power will result in more positive learning than use of other bases. A primary goal of this series of studies is to test and refine this latter assumption.

Power and Perception

Teacher power exists only in so far as students perceive it to exist. If the student perceives the teacher to have one or more types of power, that teacher indeed does have those types of power—with that student. If the perception is absent, the power is absent, no matter what the teacher may think. To illustrate let us take the extreme example of the often assumed power of the teacher to punish a student with low grades. That power only exists if the student wants to avoid low grades, and not all students have that orientation. If the student does not care about grades, even though the teacher can give low grades, the teacher does not have the power to influence that student's behavior.

As the above illustration indicates, teachers may have less power than they think they do. On the other hand, they may have more power than they think they do as well. Teachers often fail to recognize the power they have as models for students. An incident which occurred in a second grade classroom is illustrative. A teacher in her first year after completing college had a class of 28 students, 12 male and 16 female. She was very well liked by the children, particularly the females. The teacher spoke with a distinct lisp. By the end of the first semester, 12 of her female students were also speaking with a lisp. While she certainly had not consciously attempted to influence the children with a lisp, she was a strong model (referent power) for the children and did influence their behavior.

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Purpose of the Study

Study I yielded instruments which were deemed acceptable for measuring perceptions of power in the classroom and provided an indication of the degree to which teachers and students share perceptions of teacher use of power in the classroom. The present study sought to advance this research program by determining the degree to which these perceptions of power use are related to student learning. Specifically, two research questions were addressed: 1) Are teacher and/or student perceptions of teachers use of power associated with student cognitive learning? 2) Are teacher and/or student perceptions of teachers use of power associated with student affective learning?

On the basis of previous writings in the field of education, it was believed that increased use of coercive power would negatively impact learning while increased use of reward, referent, and expert power would be likely to enhance learning. However, since the only previous research that would support our beliefs was at best tangential, we did not advance formal hypotheses reflecting our expectations.

Method

Measurement

Power Use. The Perceived Power Measure (PPM) and Relative Power Measure (RPM) developed in the previous study were employed in this study. Alpha reliability estimates for each of the five power bases for both teachers and students on the PPM were above .96. Because of the nature of the instrument, no reliability estimates could be made for the RPM measures.

Cognitive Learning. The subjects in this study were selected to maximize generalizability of the results. Students from seventh grade through college from a wide variety of subject matter areas were employed. This procedure made it impossible to use a consistent cognitive learning test for all subjects.

As a crude measure of cognitive learning, we asked the students in the study to record the grade they expected to receive in the class on an 8-step continuum: A;A-/B+;B;B-/C+;C;C-/D+;D;D-/F. Since the students completed the study very near the end of the semester, it was hoped that their reports would be very close to the actual grade they would receive. In a pilot test of this measure, 86 students completed the instrument. Unlike the present study, these students did not complete the form anonymously. Their reports were compared to the actual reports of their teachers. The resulting correlation was .89.

While the pilot test suggests the student reports are a valid indication of the grades awarded by teachers, we caution that this does not speak to a more critical validity question. Grades in a course are, at best, a crude indication of student learning. Thus, it should be recognized that our measure of cognitive learning, while the best we could develop for this study, is highly subject to error. Thus, any observed correlations should be considered very conservative estimates of the true association between cognitive learning and our predictor variables.

Affective Learning. Affective learning was conceived as positive attitudes toward the course, its content, and the instructor as well as increased likelihood of engaging in behaviors taught in the class and taking additional classes in the subject matter. Attitudes toward the content of the course, behaviors recommended in the course and the course instructor were measured by four, seven-step bipolar scales: good/bad; worthless/valuable; fair/unfair; and positive/negative. To

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measure behavioral intention, the subjects were asked to respond to two statements on four bipolar, seven-step scales. The statements were 1) "In real-life situations, your likelihood of actually attempting to engage in the behaviors recommended in the course," and 2) "Your likelihood of actually enrolling in another course of related content if your schedule so permits." The scales were likely/unlikely, impossible/possible, probable/improbable, would not/would. Alpha reliabilities for each of the measures for the student sample were above .90.

Samples

Data for this study were drawn from paired samples of teachers and classes of students. A total of 151 teachers and 2603 of their students provided usable data. An additional 9 teachers and 258 students provided incomplete data and were excluded from the data analyses.

To insure as much generalizability as possible, teachers and students were selected from diverse educational levels and academic disciplines. All levels from seventh grade through college were included. Similarly, teachers and classes from sciences, humanities, social sciences, and arts were included. At the college level, both regular faculty and graduate assistants were included. The only restriction placed on selection of a class for inclusion was enrollment. No large classes (over 35) were chosen. Because of the method of data collection provided strong guarantees of anonymity, we are unable to specify the exact number of respondents in each category. The original sample included 200 teachers selected in a systematic, non-random manner. Forty, or 20 percent, did not return the data collection instruments. However, on the basis of the legible postmarks and return addresses of the materials returned, no systematic bias was suspected.

Procedure

Because of the sensitive nature of the data being collected and the obvious potential for providing socially desirable responses, it was deemed essential that anonymity of responses be absolutely assured. Consequently, no personal information was requested from either the teachers or the students. However, it was necessary to be able to pair student responses with those of their teacher. Thus, each teacher was asked to select a five-digit number at random and record it on their response form. They were asked to request that each of their students place the same number on their forms.

Teachers were selected and asked to participate. Those that agreed were sent the appropriate forms with instructions for their completion and return. No follow-up correspondence to increase return rate was employed because the anonymous responses did not permit knowledge of who had returned materials and who had not.

Data Analyses

All data analyses were performed with the assistance of the SAS statistical package. Data for individual subjects were punched separately and teacher and student data paired by means of the MERGE procedure available in this statistical package.

The first step in the data analysis was computation of single and multiple correlations between each of the measures of power use, as perceived by teachers and students, and the measures of cognitive and affective learning. These

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correlational analyses provided the basic information to answer our research questions. The second step in the data analysis was computation of multiple correlations between each group of power use perceptions, for both teachers and students, and the affective learning measures. These analyses were employed to determine whether there were more complex relationships between perceived power use and affective learning than could be observed with the simple correlational analyses

Results

Cognitive Learning

Teacher Perceptions. The results of the simple and multiple correlations of power use with cognitive learning are reported in Table 4. As can be seen in that table, only one simple correlation for the teacher sample was significant, that for the RPM measure of referent power. Higher referent power was associated with higher cognitive learning. With regard to the multiple correlations, neither was significant at the alpha = .05 level, although both approached significance ($p<.10$).

Student Perceptions. The results of the simple and multiple correlations of power use with cognitive learning are reported in Table 4. Six of the simple correlations for the student sample were significant, those for both the PPM and RPM measures of coercive, legitimate, and referent power. Lower coercive and legitimate power and higher referent power were associated with higher cognitive learning. With regard to the multiple correlations, both were significant and they were identical, $r=.43$.

Combined Perceptions. Multiple correlations analyses involving various combinations of teacher and student PPM and RPM measures were computed and the results are presented in Table 7. Teacher PPM and RPM alone, as noted above, did not generate significant multiple correlations, although the non-significant relationships accounted for between 6 and 7 percent of the variance in cognitive learning. When combined, the two measures accounted for approximately 11 percent of the variance, but the multiple correlation was still not significant. Student PPM and RPM alone, as noted above, both generated significant multiple correlations. Each measure predicted approximately 19 percent of the variance in cognitive learning. When combined, the two measures generated a significant multiple correlation accounting for 20 percent of the variance in cognitive learning.

Little colinearity in prediction was found between the teacher and student measures. When the teacher and student PPM measures were employed, the resulting significant multiple correlation accounted for approximately 22 percent of the variance in cognitive learning. When the RPM measures were employed, the predictable variance was approximately 24 percent. The analysis employing all four power measures resulted in approximately 30 percent of the variance in cognitive learning being predicted.

Affective Learning

Teacher Perceptions. The results of the simple and multiple correlations of power use, as perceived by the teacher sample, with each of the five measures of affective learning are reported in Table 5. As can be seen in that table, none of the simple correlations between affect and either reward power or expert power were significant, and a mixed pattern of results was obtained for associations between affect and both legitimate and referent power. Legitimate power was negatively associated with affect, but only in the data generated by the PPM

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measure. Similarly, referent power was positively associated with affect, but only in the data generated by the RPM measure.

The results relating to coercive power and affect were much more consistent. Eight of the 10 simple correlations were significant, and all of the relationships indicated a negative association between use of coercive power and student affect.

Seven of the 10 obtained multiple correlations were significant, accounting for from 7 to 19 percent of the variance in student affect. Associations were strongest with affect toward instructor and weakest (actually non-significant) with intent to use behaviors taught in the class in future life.

Student Perceptions. The results of the simple and multiple correlations of power use, as perceived by the student sample, with each of the five measure of affective learning are reported in Table 6. All of the obtained simple correlations between affect and both coercive and referent power were significant. For both legitimate power and expert power 8 of the 10 obtained correlations with affect were significant. For reward power, on the other hand, only 2 of the 10 obtained correlations with affect were significant. Coercive and legitimate power were negatively associated with affect while referent and expert power were positively associated.

All of the obtained multiple correlations were significant, accounting for from 23 to 61 percent of the variance in student affect. As was the case with the results based on the data supplied from teachers, associations were strongest with affect toward instructor and weakest with intent to use behaviors taught in the class in future life.

Combined Perceptions. Multiple correlation analyses involving various combinations of teacher and student PPM and RPM measures were computed and the results are presented in Table 7. Teacher PPM and RPM alone generated significant multiple correlations in 7 of 10 cases, with predictable variance ranging to a high of 19 percent. When combined, three of the five obtained multiple correlations were significant with predictable variance ranging between 18 and 25 percent. The relationships between power and behavioral intent and course enrollment, however, were not significant, although accounting for between 9 and 10 percent of the variance.

All of the multiple correlations which employed student PPM and RPM alone generated significant results, with predictable variance ranging between 23 and 61 percent. When combined, all five obtained multiple correlations were significant with predictable variance ranging between 35 and 65 percent.

Unlike the results reported above concerning cognitive learning, substantial colinearity in prediction was found between the teacher and student measures with regard to affective learning. When the teacher and student PPM measures were employed, the resulting significant multiple correlations accounted for from 31 to 63 percent of the variance in affect. When the teacher and student RPM measures were employed, the predictable variance ranged from 23 to 52 percent. When all four measures were employed, the predictable variance ranged from 38 to 69 percent. The extent of the colinearity is best illustrated by the fact that the teacher measures alone could account for 25 percent of affect toward instructor and the student measures alone could account for 65 percent of that variance, but the combined predictability of teacher and student measures only increased to 69 percent.

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Limitations

Before we discuss the results presented above and attempt to draw some conclusions, it is important that several limitations of this study be emphasized. In particular, we wish to address 1) the limitations of the cognitive learning variable, 2) the limitations of the method of analyzing the student-generated data, and 3) the potential confounding of cognitive learning, as measured in this study, with affective learning.

Cognitive Learning. Although we have addressed this issue previously, we wish to reemphasize the fact that our measure of cognitive learning was a student's report of an anticipated teacher-assigned grade. Even presuming the validity of our measure as an accurate estimate of the grade to be assigned, which our pilot data suggests is appropriate, a course grade may not be highly reflective of actual cognitive learning. Grades often are influenced by such potentially irrelevant elements as attendance, class participation, and teacher affect toward the student. Thus, our measure of cognitive learning is, at best, a crude estimate of such learning. However, we believe the error introduced by such a measure is much more likely to be random error, leading to Type II error, than it is to be systematic error, leading to Type I error, particularly with regard to relationships between power perceptions of teachers and the student grade reports. Thus, obtained relationships with cognitive learning, where significant, probably represents real relationships, but it is very likely that the magnitude of those relationships is substantially underestimated. Similarly, the absence of a significant relationship should not be taken as convincing proof that no such relationship actually exists.

Analyses of Student Data. All of the analyses of student generated data reported above were computed in aggregate form. That is, the student data from each teacher's class was reduced to mean responses prior to analysis. This method was selected for a number of reasons. First, this method increases the comparability of teacher and student data in that both represent general perceptions of power use. While teachers do not, in all likelihood, use power in precisely the same ways with all students, their reports of power use must of necessity be generalized responses. Aggregating the student responses permits an approximation of a similar generalized response. Second, aggregating student responses increases the reliability of the resulting score, since reliability is partially a function of number of respondents. This, of course, is a mixed blessing, since the teacher responses represented a single respondent per case. Thus, the student responses may be more reliable than the teacher responses and consequently may artifactually generate higher correlations. Finally, this method was chosen because it was required for all analyses which involved teacher data. The only alternative was to enter the same teacher's score for multiple students and, thus, artificially inflate the sample size.

In order to estimate the potential impact of this choice for analytical method simple and multiple correlations were computed for the student data between the PPM measure and the dependent variables employing both the raw and the aggregated data. The results are reported in Table 8. As indicated in that table, approximately the same number of correlations were significant, whether computed with raw or aggregated data. However, the magnitude of the raw correlations was, in many instances, much smaller than correlations based on aggregated data.

The results of the raw and aggregated data analyses suggest two important conclusions. First, the aggregated data procedure employed in this study generated substantially higher correlations than would have been the case had raw data been used for the student analyses. Competing interpretations of this finding cannot be discounted: 1) the aggregated analyses are correct because they

reflect a generalized student reaction that has higher reliability than single student reactions would have, and 2) the raw data analyses are correct because they reflect the fact that individual students are not treated in the same ways by teachers and this differential treatment is reflected in the individual student's responses but lost when the data are aggregated for analysis.

Second, the smaller correlations obtained in the raw data analyses are much more comparable to those obtained with the teacher data. This suggests that comparisons between teacher responses and student responses in terms of predictive power must be drawn with extreme caution. In addition, this suggests that a major threat to the internal validity of this study does not appear to have been a problem. What we are referring to is the potential for inflating correlations as a function of obtaining data from the same subjects at the same time which are to be used as both predictor and criterion variables. Since the raw data correlations between the student-generated predictor variables and the student-generated criterion variables are very similar to those of the teacher-generated predictor variables which were taken from different people at a different time, this potentially biasing factor does not seem to have been troublesome.

Confounding of Cognitive and Affective Learning. While many teachers and educational scholars have argued that elements which would improve one type of learning (eg. cognitive) may be expected to have a similar impact on another type of learning (eg. affective), research data generally have failed to show any strong positive association between effects on any two types. On average affect toward instructor and cognitive learning have been found to share 18 percent of the variance in previous research while affect toward the course and cognitive learning have been found to share 22 percent of the variance (Cohen, 1981). However, in many studies variables that have been found to enhance one type of learning have been found not to be associated with another type, and some studies even have found negative associations. Nevertheless, in this study the potential for confounding of cognitive and affective learning needs to be considered because the cognitive learning data are anticipated teacher grades.

It is often argued that teachers who give higher grades are more positively evaluated by their students on the usual teacher evaluation forms. Early research indicated the grade the student receives and student evaluation of the teacher are not meaningfully related (Remers, 1928). More recent research (Cooper, Stewart & Gudykunst, 1982) helps to explain this absence of relationship. While they found the actual grade to be unrelated to teacher evaluation, they found that the level of perceived accuracy of grading was strongly associated with teacher evaluation. Since differential use of power (eg. using grades as punishments or rewards) may well communicate relevant information concerning grading accuracy, we were concerned that true effects on affect might be masked by colinear effects on our measure of cognitive learning.

Data relevant to this concern are reported in Table 7. As is indicated in that table, only 6 to 9 percent of the variance in affect was predictable by grades alone. The largest impact was on whether a student would be likely to take another course in the same subject area. Higher grades were associated with greater likelihood of taking another course, a result that we feel is intuitively correct from our own experience, in both the student and teacher role.

While the amount of variance predictable by grade assigned may not have major social significance (its significance clearly is debatable), this amount of variance is a concern in this study. We believe, however, that no meaningful confounding was present in this study. Comparing the multiple correlations

including grade with those not including grade, reported in Table 7, indicates the predictive power of grade is almost entirely colinear with the power predictions. In almost every case the increase in predictive power for grade is less than 2 percent (with the exception of probable future course enrollment). Since power was found to be a significant predictor of grade, such colinearity clearly should be expected.

Discussion

Within the bounds of the limitations discussed above, the results of this study permit several strongly data-based conclusions. The first, and probably most important, is that the use of power in the classroom has a major association with student learning, both cognitive and affective. In this study perceived use of power could account for approximately 30 percent of the variance in cognitive learning. In addition, from 38 to 69 percent of affective learning, depending on dimension of affect, could be predicted by perceptions of power.

Establishing causation in a study such as this is problematic at best. Correlation does not prove the existence of a causal relationship but only suggests such a relationship may exist. Reverse and reciprocal causation, as well as causation from an unmeasured factor(s), are always competing explanations that cannot be absolutely discounted. With this caveat, we believe a causal explanation of these results is tenable. Since these data were collected near the end of the course involved, at least one necessary (but not sufficient) element to establish causation was present, the presumed cause (use of power) occurred prior to the presumed effect (learning). Simply then, we argue that teachers' use of power has a causal impact on student cognitive and affective learning.

Presuming we are correct in concluding causality is present, it is important to consider the nature of that causality. In short, which kind(s) of power help, and which kind(s) hurt? To answer this question, we will refer to the simple correlation analyses, since the multiple-correlation (regression) analysis yielded beta weights (not reported here to conserve space) entirely consistent with the simple correlation results and canonical correlational analyses (not reported here for the same reason) uncovered no higher order or more complex relationships.

The results reported in Tables 4-6 present a fairly clear and consistent picture. The use of coercive power, and to a lesser extent the use of legitimate power, serves to retard both cognitive and affective learning. Clearly, teachers should strive to avoid use of these power bases. It is encouraging to note that in the first phrase of this research program it was found that, in fact, both teachers and students perceive these two power bases as being used substantially less than the remaining bases.

The results also clearly indicate that use of referent power, and to a lesser extent use of expert power, serves to enhance learning. Obviously, then, teachers should strive to employ these power bases whenever possible. Again, it is encouraging to note that in the first phase of this research teachers and students were found to perceive that these two power bases were the two most commonly employed by teachers.

A possibly nonintuitive conclusion may be drawn from the results relating to use of reward power. For the most part, use of reward power was found to be unrelated to either cognitive or affective learning. This raises a significant challenge to those who argue that rewards should be employed to motivate students.

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Such an approach does not seem to be effective, if the results of this study are to be believed. What then can be recommended with regard to reward power? The answer does not seem to be either a simple "use it" or "don't use it".

While referent and expert power clearly are the power options to be preferred, both rest on a foundation of a good relationship between the student and teacher. The student must see the teacher as a referent and/or an expert for these bases of power to exist. The importance of reward power, it would appear, arises when the teacher lacks referent or expert power. At this point, one of the three remaining bases must be chosen. Since use of coercive and legitimate power clearly leads to negative outcomes, reward power becomes the option of choice. While it may not actually increase learning, at least it does not retard it, and using reward power for a while may permit the teacher sufficient time to build referent and/or expert power bases. Reward power, then, may not have the positive effects which have been claimed for it in the past, but it may be a valuable tool as a substitute for negative approaches when more positive approaches are not possible.

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Table 1

Alpha Reliability Estimates

PPM	Teacher Sample	Student Sample
Coercive	.99	.97
Reward	.98	.97
Legitimate	.98	.98
Referent	.97	.97
Expert	.98	.97

Table 2

Simple Statistics, t-tests, and Correlations for All Measures

Measure	Teacher $\bar{X}$	Sample SD	Student $\bar{X}$	Sample SD	$\bar{X}$ Difference	t	r
PPM							
Coercive	17.1	9.5	17.0	8.7	.1	.13	.46***
Reward	26.3	7.5	22.5	6.5	3.8	5.21***	.16*
Legitimate	23.7	9.3	22.9	6.5	.8	5.99	.21*
Referent	26.0	6.9	23.3	7.3	2.7	3.70***	.17*
Expert	29.3	5.6	24.6	7.1	4.7	7.34***	.22*
RPM							
Coercive	13.1	15.7	16.8	15.4	-3.7	2.65**	.37***
Reward	18.6	14.6	19.2	12.6	- .6	.45	.25**
Legitimate	16.2	14.6	16.4	11.3	- .2	.14	.06
Referent	20.4	14.9	21.9	15.3	-1.5	1.04	.29***
Expert	31.3	18.9	26.0	17.1	5.3	3.03**	.27**

* $p < .05$
** $p < .01$
*** $p < .001$

Table 3

Correlation Coefficients for Significant Canonical Variates - PPM Data and RPM Data

PPM Measure	Variate 1 Teacher	Variate 1 Student	Variate 2 Teacher	Variate 2 Student	Variate 3 Teacher	Variate 3 Student
Coercive	.90	.92	-.06	.07	-.01	-.19
Reward	.12	.13	-.32	-.34	.75	.44
Legitimate	.56	.61	-.10	-.12	.05	-.19
Referent	-.09	-.47	-.41	-.19	-.60	-.46
Expert	.20	.03	.68	.93	-.03	-.06

RPM Measure	Variate 1 Teacher	Variate 1 Student	Variate 2 Teacher	Variate 2 Student
Coercive	.79	.75	.36	.42
Reward	-.24	-.51	.61	.75
Legitimate	-.30	.06	.24	.35
Referent	-.61	-.69	-.35	-.45
Expert	.23	.28	-.77	-.60

Table 4

Correlations Between Power Use and Cognitive Learning

Power Dimension	Power Measure: PPM Teacher	PPM Student	RPM Teacher	RPM Student
Coercive	-.15	-.33*	-.10	-.31*
Reward	.02	.07	.10	.08
Legitimate	-.14	-.25*	-.07	-.21*
Referent	.11	.33*	.20*	.36*
Expert	.12	.04	.06	.02
Multiple r	.26**	.43*	.25**	.43*

*p < .05
**p < .10

Table 5

Correlations Between Power Use and Affective Learning
Teacher Sample

Power Dimension	Recommended Behaviors	Affect Measure: Instructor	Course Content	Behavioral Intent	Course Enrollment
Coercive					
PPM	-.38*	-.41*	-.31*	-.17*	-.20*
RPM	-.21*	-.32*	-.23*	-.14	-.12
Reward					
PPM	-.03	-.08	-.12	-.06	-.04
RPM	-.09	-.09	-.06	-.06	-.01
Legitimate					
PPM	-.19*	-.14	-.25*	-.18*	-.21*
RPM	.07	.11	.09	.07	.04
Referent					
PPM	.03	.09	.05	.06	-.01
RPM	.19*	.35*	.25*	.18*	.15
Expert					
PPM	-.02	-.05	-.12	-.12	-.11
RPM	.07	.00	-.02	.01	-.01
Multiple Correlation					
PPM	.40*	.41*	.37*	.23	.27*
RPM	.27*	.44*	.31*	.24	.19

*$p < .05$

Table 6

Correlations Between Power Use and Affective Learning
Student Sample

Power Dimension	Recommended Behaviors	Affect Measure: Instructor	Course Content	Behavioral Intent	Course Enrollment
Coercive					
PPM	-.45*	-.51*	-.46*	-.27*	-.32*
RPM	-.50*	-.62*	-.57*	-.39*	-.33*
Reward					
PPM	.04	.23*	.04	.19*	.11
RPM	-.15	.02	-.13	-.09	-.06
Legitimate					
PPM	-.24*	-.26*	-.22*	-.02	-.30*
RPM	-.22*	-.22*	-.18*	-.09	-.34*
Referent					
PPM	.41*	.65*	.49*	.48*	.50*
RPM	.36*	.56*	.40*	.38*	.40*
Expert					
PPM	.29*	.28*	.40*	.38*	.18*
RPM	.23*	.12	.30*	.19*	.12
Multiple Correlation					
PPM	.61*	.73*	.66*	.54*	.59*
RPM	.59*	.71*	.54*	.48*	.54*

*$p < .05$

Table 7

Predictable Variance in Dependent Variables

Predictor(s)	Dependent Variable: Grade	Recommended Behaviors	Instructor	Course Content	Behavioral Intent	Course Enrollment
(A) Grade	-----	.058	.072	.084	.060	.087
(B) Teacher PPM	.068*	.160	.168	.135	.053*	.073
(C) Teacher RPM	.063*	.073	.194	.096	.058*	.036*
(D) Student PPM	.185	.372	.608	.436	.292	.348
(E) Student RPM	.185	.348	.504	.410	.230	.292
AB	-----	.247	.281	.233	.135	.261
AC	-----	.182	.317	.222	.157	.246
AD	-----	.390	.623	.455	.313	.418
AE	-----	.368	.517	.434	.256	.372
BC	.109*	.214	.248	.177	.091*	.095*
BD	.215	.402	.631	.464	.305	.376
CE	.235	.368	.518	.418	.226	.292
DE	.200	.438	.652	.500	.352	.388
ABC	-----	.290	.360	.276	.172	.276
ABD	-----	.417	.638	.476	.325	.438
ACE	-----	.391	.535	.450	.260	.377
ADE	-----	.453	.661	.520	.381	.458
BCDE	.295	.492	.685	.543	.378	.428
ABCDE	-----	.504	.694	.557	.403	.485

*p > .05

Table 8

Raw- and Aggregated-Data Correlations of Student PPM with Dependent Variables

PPM Dimension	Affect Measure: Cognitive Learning	Recommended Behaviors	Instructor	Course Content	Behavioral Intent	Course Enrollment
Coercive						
Raw (R)	-.16*	-.13*	-.22*	-.16*	-.08*	-.09*
Aggregated (A)	-.33*	-.45*	-.51*	-.46*	-.27*	-.32*
Reward						
R	.03	.11*	.14*	.11*	.14*	.10*
A	.07	.04	.23*	.04	.19*	.11
Legitimate						
R	-.06*	-.01	-.06*	-.02	-.01	-.04
A	-.25*	-.24*	-.26*	-.22*	-.02	-.30*
Referent						
R	.15*	.25*	.35*	.27*	.25*	.23*
A	.33*	.41*	.65*	.49*	.48*	.50*
Expert						
R	.04	.17*	.23*	.18*	.13*	.10*
A	.04	.29*	.28*	.40*	.38*	.18*
Multiple Correlation						
R	.22*	.29*	.41*	.31*	.28*	.25*
A	.43*	.61*	.78*	.66*	.54*	.59*

*$p < .05$; Raw, N=151; Aggregated, N=2603.